

CLAIMS

1. A LIN bus system comprising a plurality of modules linked to a LIN bus along which electronic data or instructions can be sent to and from each said module, at least one of said modules being non configured and having no unique identification address associated therewith, said at least one module having a  
5 unique code associated therewith, said system further including configuration means which interrogates said modules and detects the unique code of said at least one non-configured module and transmits a configuration signal to the module to configure the module, each said non configured module including  
10 counter means which is incremented each time a non configured is configured, said counter of each non-configured module, once configured, providing a unique code which is indicative of the position of the module in the system.
2. A LIN bus system as claimed in claim 1 wherein the at least one module having a unique code associated therewith is a reconfigurable module having  
15 means for being configured with an ID and also having embedded within it at the manufacturing stage a fixed unique Chip Identification Code (CIN) for use during a configuring operation.
3. A LIN bus system as claimed in claim 2 wherein said reconfigurable module is a module compatible with the LIN bus Standard.
- 20 4. A LIN bus system as claimed in claim 3 wherein said reconfigurable module has two LIN Bus interface pins connected by a series resistor.
5. A LIN bus system as claimed in claim 4 wherein the series resistor is a 1 ohm resistor.

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6. A LIN bus system as claimed in any preceding claim wherein said reconfigurable module further comprises a pull up resistor and a pull up current source for forcing a pull up current through the pull up resistor.
7. A LIN bus system as claimed in any one of claims 3 to 6 wherein if a number  
5 of said reconfigurable modules are connected in a daisy chain manner standard LIN Bus arbitration rules apply for selecting one module from the daisy chain.
8. A LIN bus system as claimed in claim 7 wherein said pull up current only flows whilst said module is selected.
9. A LIN bus system as claimed in any preceding claim wherein said  
10 reconfigurable module further comprises a position counter, which may be incremented to indicate the position of the module in a daisy chain.
10. A LIN bus system as claimed in any preceding claim wherein said reconfigurable module further comprises a random code generator for generating a random code of a plurality of bits in length to identify the module  
15 as an alternative to the CIN code.
11. A LIN bus system as claimed in any preceding claim wherein said unique code is a CIN.
12. A LIN bus system as claimed in anyone of claims 1 to 10 wherein said unique code is a randomly generated code.
- 20 13. A LIN bus system as claimed in any preceding claim wherein said LIN Bus system comprises a plurality of non-configured reconfigurable modules connected together in a daisy chain manner.

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14. A LIN bus system as claimed in claim 13 wherein a configuration sequence is performed to configure each of the plurality of non-configured reconfigurable modules.
- 5 15. A LIN bus system as claimed in claim 14 wherein during a configuration sequence the bus master transmits a configuration request and all non-configured reconfigurable modules respond by transmitting a reply consisting of their unique code.
- 10 16. A LIN bus system as claimed in claim 15 wherein standard LIN bus arbitration rules apply, wherein active states win over recessive states, and one non-configured reconfigurable module will thus win the arbitration and become the 'selected module'.
17. A LIN bus system as claimed in claim 16 wherein the selected module then forces a current through its pull up resistor.
- 15 18. A LIN bus system as claimed in claim 17 wherein non-selected non-configured reconfigurable modules can monitor this current through their series resistors and thereby determine that a selected module is responding.
19. A LIN bus system as claimed in any preceding claim wherein each non-configured reconfigurable module incorporates a position counter incremented on each occasion that a selected module responds with a forced current.
- 20 20. A LIN bus system as claimed in claim 19 wherein the position counter on a particular non-configured reconfigurable module is not incremented when the particular non-configured reconfigurable module is itself selected

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21. A LIN bus system as claimed in claim 20 wherein the position counter on a particular non-configured reconfigurable module is not incremented after the particular module has been selected.

22. A LIN bus system as claimed in claim 21 wherein once all un-configured extended capability modules have been selected each will have a position counter showing a unique position for that module within the daisy chain and this unique position counter value can then be used to select a module and configure it for use in the system.

23. A method of configuring a LIN Bus system comprising a plurality of said non-configured reconfigurable modules connected in a daisy chain manner comprising the steps of: transmitting a configuration request from a bus master; selecting one module from the daisy chain by standard LIN bus arbitration rules; forcing a current through the pull up resistor of the selected module; incrementing the position counter of each module within the daisy chain that is not currently or previously selected; repeating the above steps until each module in the daisy chain has been selected, the position counters for each module thus showing its unique position in the chain; and using the unique position counter value to select and configure a desired module or a plurality of desired modules.

24. The method of claim 23 wherein the LIN bus system is a LIN bus system as claimed in anyone of claims 1 to 22.